

## Operating instructions

Machine designation: Manual blasting unit

Machine type: D-H 22 S

Machine no.: .....

**Hausanschrift:**

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*Keep for future reference!*

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## Dear customer,

Thank you for the confidence you have placed in us by purchasing this manual blasting unit.

For this unit to be of service to you for many years to come, please take the time to read these operating instructions carefully, especially before using the unit for the first time.

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# 1 Safety

## 1.1 Intended use

The D-H 22 S manual blasting unit is intended for use in dental laboratories:

- for removing the residuals of embedding materials and oxides on cast components after their being unbedded,
- for leveling and smoothing of cast component surfaces and
- for polishing

Unauthorized modifications and additions are not permitted for safety reasons!

The conditions for operating, maintaining and cleaning the unit, as described in these operating instructions, must be strictly adhered to.

**Caution** The device is not designed to be used as a **medical** device !

Application on humans is not permissible!

## 1.2 Possible dangers

- The D-H 22 S manual blasting unit is safe when used as intended. However, when not used properly or with care its use can lead to injuries of eyes or skin due to the sand blast leaving the injector.
- If the front flap is open you should not activate the (removable) injector.
- Potential ignition sources should not be suctioned.
- Before maintenance work and cleaning, the unit should be switched off and disconnected from the mains supply (i. e. the mains plug should be pulled).
- Before accessing any of the incorporated electric components, the unit should be disconnected from the mains supply!

**Danger** The device is not suitable for use in rooms within which special conditions prevail (e.g. with corrosive or inflammable/potentially explosive atmospheres).

## 1.3 Approved operators

The operator of the machine should make sure that the operating instructions are accessible to the operating personnel. The operator should make sure that they have been read and fully understood by the operating personnel. Only then should they be allowed to operate the machine.

## 1.4 Safety measures at site of operation

The installation surface should be flat and stable according to the weight of the manual blasting unit.

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Make sure by endorsing appropriated corporate instructions and control mechanisms that the pin drilling workplace always complies with the pertinent accident prevention regulations.

Foreign bodies should not be inserted through the ventilation openings of the unit.

## 1.5 Marking of safety references contained in these instructions

<b>Note</b>	Refers to tips and other particularly helpful pieces of information.
<b>Caution</b>	Refers to particular ways of operation or handling, the non-adherence of which can lead to malfunctioning, damages or other kinds of trouble.
<b>Danger</b>	<b>Refers to dangerous situations, in which injuries can occur.</b>

## 2 Initial/setting into operation

### 2.1 Technical data

Machine designation	: Manual blasting unit
Machine type	: D-H 22 S
Overall dimensions	: Width 450 mm (with plug for foot switch), Depth 485 mm (with control knob for working pressure), Height 600 mm.
Electrical connection	: 230 volts/50 Hz
Oversupply category	: II
Compressed air connection	: max. 10 bar
Power consumption	: approx. 410 watts
Sound pressure level	: 58 dB(A) min. air capacity 68 dB(A) max. air capacity
Fine-particle filter quality:	: dust class M, DIN EN 60335
Electrical fuse protection	: 2x 2.5 A/T
Blasting chamber illumination	: LED 7 Watt, 24 V
Compressed air capacity	: max. approx. 200 l/min.
Weight	: approx. 35 kg.

## 2.2 Unpacking the manual blasting unit

(See fig. 2, page 6)

1. Take off top box lid.
2. Open the box from above and remove the packing material
3. The unit must be lifted out of the carton by 2 people (approx. 35 kg).
4. Check the accessories
  - Documentation
  - Mains connection cable ..... no. 35 028
  - Foot switch with cable and plug ..... no. 67 010
  - 2 m PVC fabric hose, blue Ø 8.2 x 6 with insert sleeve for quick-action coupling and swivel nut..... no. 72 350

## Identification and description of the unit components

(See figures 1 and 3 on pages 5 and 7)

The D-H 22 S manual blasting unit can be operated with all standard laboratory polish blasting media and special fused alumina.

The pressure regulator (6) adapts the blasting force to the situation at hand. The unit is equipped with an automatic blasting agent circulation and a motor-driven blower suction unit. The ultra-fine filter insert (7) guarantees dust-free working conditions, in which the resulting dust is collected in disposable filter bags (14).

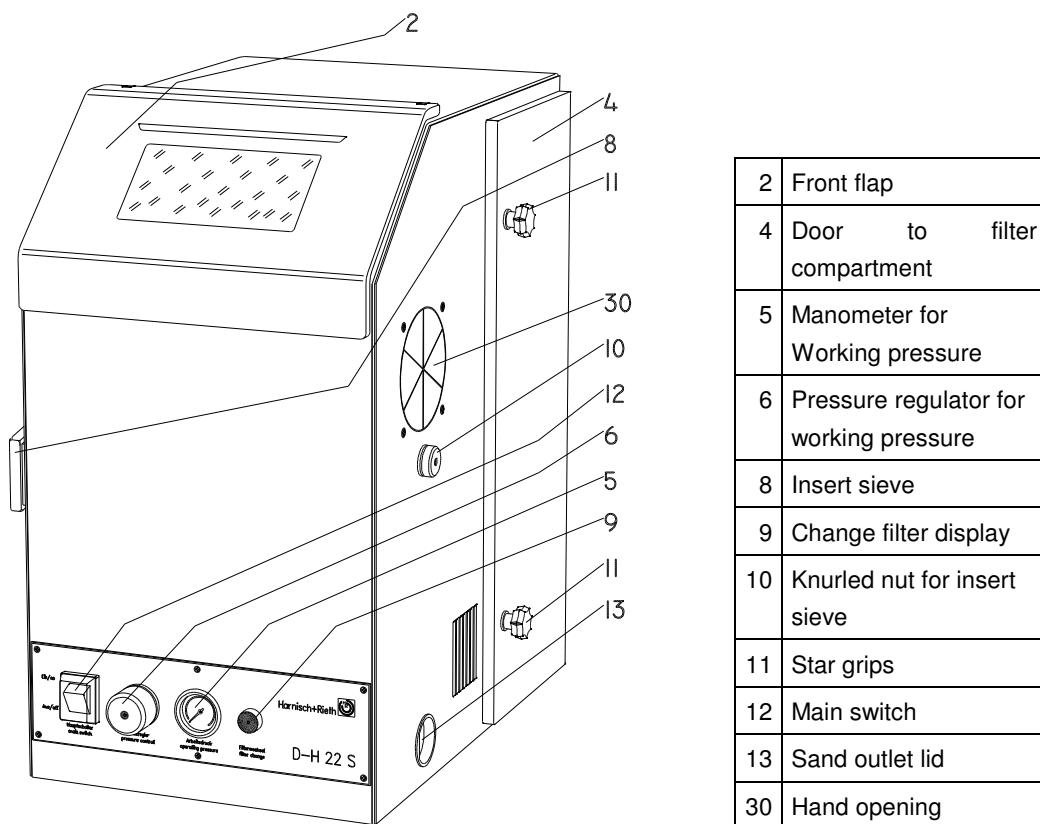


Fig. 1: Identification of the unit components

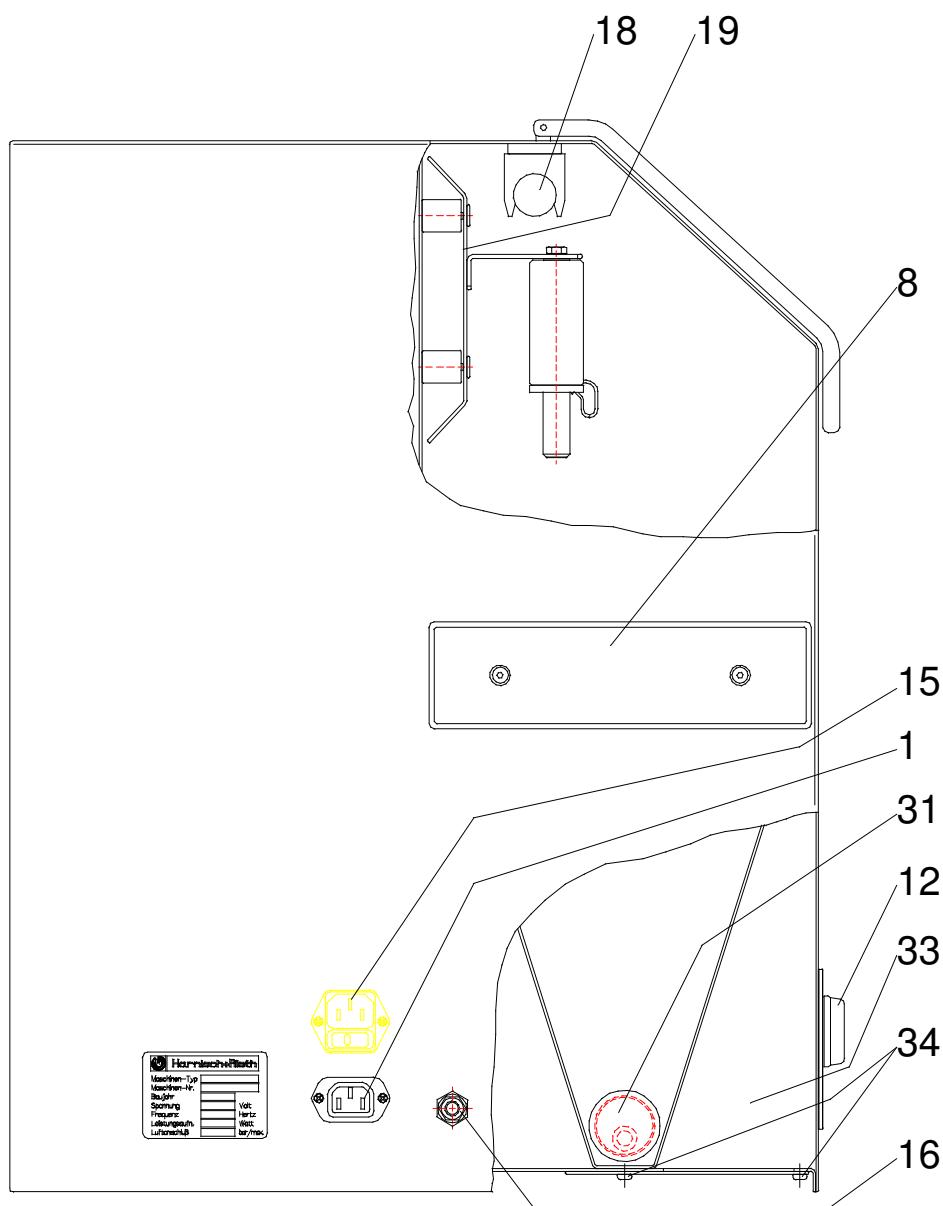


Fig. 2: Identification of the unit components

1	Socket for foot switch	18	Blasting chamber illumination LED (24 V)
8	Insert sieve	19	Injector holder
12	Main switch	31	Suction basket
15	Mains connection socket (230 V/50 Hz)	33	Front floor compartment
16	Compressed air connection	34	10 screws for front floor compartment

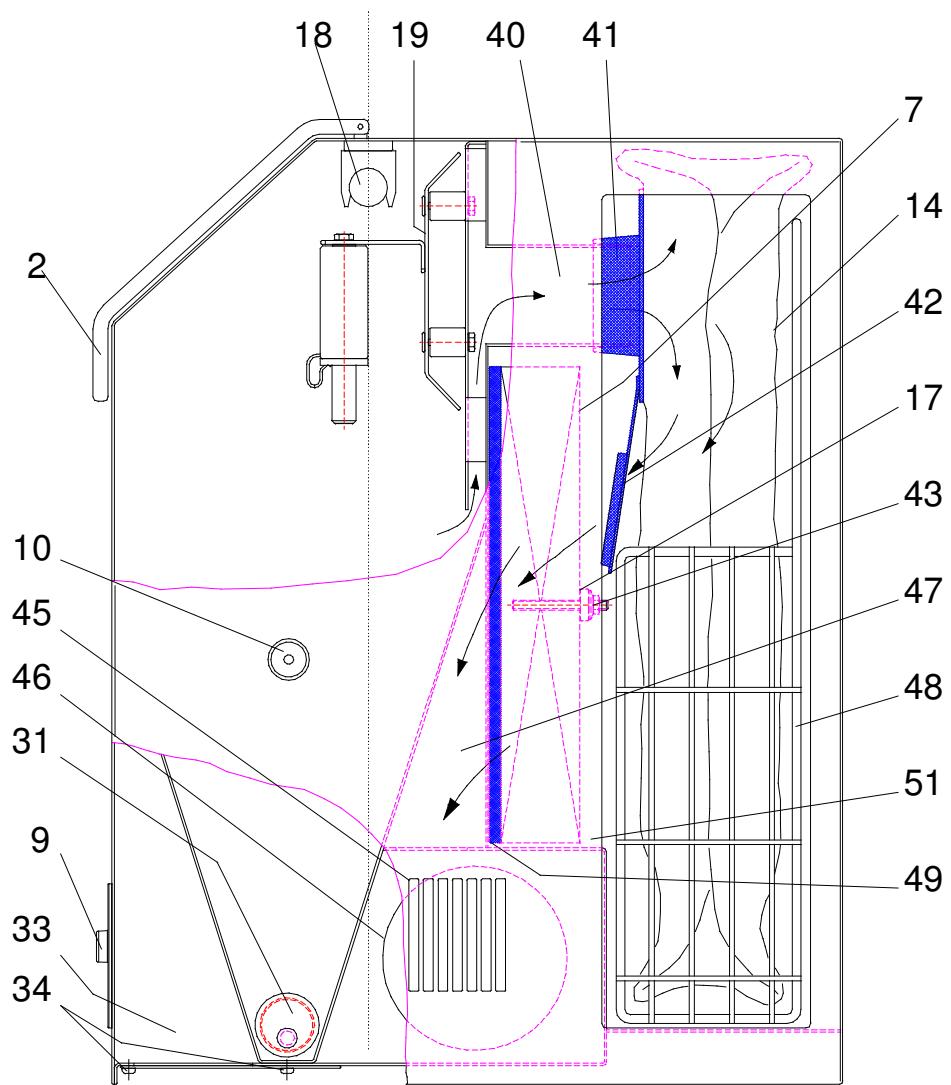


Fig. 3: Identification of the unit components

2	Front flap	40	Nozzle Ø 63 mm
7	Ultra-fine filter	41	Plastic filter bag connection
9	Change filter display	42	Filter bag cap
10	Knurled nut for insert sieve	43	2 M6 nuts
14	Filter bag	45	Air outlet
17	Strip with long holes	46	Suction motor
18	Blasting chamber illumination LED 7 Watt (24 V)	47	Suction compartment
19	Injector holder	48	Wire basket
31	Suction basket	49	Sealing surfaces
33	Front floor compartment	51	Filter compartment
34	10 screws for floor compartment		

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## 2.3 Initial/setting into operation procedure

(See figures 1 and 2, on pages 5 and 6)

1. Connect unit to compressed air supply (see section “3.1“).
2. Fill with blasting agent (see section “3.2“).
3. Connect foot switch to socket (1) (located during transport in blasting chamber)
4. Establish connection to mains supply (230 V/50 Hz) using the mains supply connection cable delivered with the unit (socket(15)).
5. Check the filter unit (see section “0“).
6. Actuate main switch (12).

**Note** Switching the unit on at the main switch renders it electrically ready for operation.

7. Suction is activated. Internal illumination lights up.
8. Adjust working pressure (blasting pressure) at pressure regulator (6) to desired value.  
The working pressure is controlled by manometer (5).

**Note** The working pressure should not be set to more than 5 bar.

9. The sanding jet (exits the injector) is released by actuating the foot switch.

## 3 Operation

### 3.1 Connecting the blasting unit to the compressed air supply

(See fig.2 page 6)

1. Connect the fabric hose delivered with the unit to the compressed air connection (16).
2. Connect insert sleeve for rapid-action coupling to compressed air supply (max. 10 bar).

**Caution** The compressed air used must be free of humidity and oil.  
In order to maintain trouble-free working conditions, you should connect a water separator directly in series or at a max. distance of 1m to the unit.

## 3.2 Blasting agents

(See fig.1 page 5)

At works the unit is design for the following blasting agents:

Type of blasting agent	Blasting agent class
Polish blasting medium (Al-oxide)	cl. 60 B (120 µm) EW 60 (250 µm) EW 80 (180 µm)
Special fused alumina	cl. 150 A (150 µm)

**Caution**

The unit is designed for the use of HARNISCH+RIETH blasting agents. We do not grant guarantee for malfunctioning or damages which result from the use of other kinds of blasting agents.

1. Open front flap (2).

**Note**

Loosen knurled nut for insert sieve (10). Pull out insert sieve (8) by  $\frac{3}{4}$  so that you can check the level of the blasting agents more easily.

2. Fill with blasting agent until it is approx. 4 cm below the insert sieve (8).

**Caution**

To avoid malfunctioning make sure that there are no dirt particles contained in the blasting agent.

3. Insert sieve (8) and slightly tighten by hand with knurled nut (10).

## Checking the filter unit

(See figures 1 and 3, on pages 5 and 7)

**Caution**

The D-H 22 S manual blasting unit should only be operated with the ultra-fine filter (7) and filter bag (14) properly inserted and free of damages.

1. Open the door to the filter compartment (4) by screwing off the two star grips (11).
2. Make sure that the ultra-fine filter (7) is not damaged and that it is properly (i. e. tightly) pressed by strip (17) against the sealing surfaces (49).
3. The two M6 nuts (43) should be tightened securely and evenly.
4. Make sure that the filter bag (14) was not damaged while being inserted into the wire basket (48).
5. The plastic connection (41) of the filter bag should be fastened securely to the connection nozzle (40).
6. Close the door tightly to the filter compartment (4) by tightening the star grips fairly securely.

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### 3.3 Automatic deactivation device and filter control lamp

(See fig. 3 page 7)

<b>Note</b>	The max. admissible filter bag (14) quantity being reached actuates the deactivation device via a vacuum switch and the control lamp "Change filter" (9) lights up. The suction device is switched off.
	<ul style="list-style-type: none"><li>– Filter bag (14) must then be replaced. See section "4.1".</li></ul>
<b>Note</b>	If the unit is switched off by the automatic deactivation device then you can still work with it for a short while without having to change the filter bag by first switching the unit off and on again and by tapping the filter bag (14).
<b>Note</b>	If the filter bag (14) is only slightly filled when the deactivation device is actuated (Change filter display lights up) then you should check the ultra-fine filter (7) (see section "4.2").

## 4 Cleaning/maintenance

(See figures 1 and 3, on pages 5 and 7)

<b>Note</b>	If the unit is switched off by the automatic de-activation device, then you can continue for a while without having to exchange the filter bag (14) by switching the unit off and on again and then by knocking the filter bag.
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To knock the filter bag (14) open the door to the filter compartment (4) by screwing off the two star grips (11).

### 4.1 Exchanging the filter bag

(See figures 1 and 3, on pages 5 and 7)

1. Open the door to the filter compartment (4) by screwing off the two star grips (11).
2. Press the plastic connection (41) off of the nozzle (40) using both hands.
3. Seal filter bag (14) with attached plastic cap (42).
4. Take the filter bag (14) in the wire basket (48) to the waste disposal.

<b>Caution</b>	In no case should you empty and re-use the disposable paper filter bag, as this - irrespective of the possible damages to the operator's health - causes the unit to malfunction.
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<b>Note</b>	Do not use compressed air to eliminate residual dust from the filter compartment (51).
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5. Insert new filter bag (14) tightly and check filter unit (see section "0").

<b>Note</b>	See section "4.2" regarding details for changing the ultra-fine filter.
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## 4.2 Cleaning/exchanging the ultra-fine filter

(See figures 1 and 3, on pages 5 and 7)

<b>Note</b>	<p>After changing the filter bags (14) approx. ten times you should also take out the ultra-fine filter (7) and clean it (dry) or change it for a new one!</p> <p>We can also clean the ultra-fine filter (7) for you in exchange for a new one. We would be only too pleased to exchange your fine-particle filters in order to clean them, whereby only type-checked filters compliant with dust class M (DIN 60335) are employed.</p>
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1. Open the door to the filter compartment (4) by screwing out the two star grips (11).
2. Press the plastic connection (41) from the nozzle (40) using both hands.
3. Pull out the filter bag with the wire basket (48).
4. Loosen the two nuts (43) and lift out the strip (17) (with the long holes).
5. Take out the ultra-fine filter (7).

<b>Caution</b>	<p>The sealing surfaces (49) and the suction compartment (47) should be kept free of dust, as it can possibly cause damages to the suction motor (46).</p> <p>Filter compartment (51), suction compartment (47) as well as sealing surfaces (49) should be vacuum-cleaned.</p>
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6. Insert new/cleaned ultra-fine filter (7).
7. Place strip (17) from above onto the threaded pins.
8. Tighten the two M6 nuts (43) securely and evenly.
9. Slide filter bag (14) inside the wire basket (48) into the unit and press the plastic connection (41) back onto the nozzle (40) using both hands.
10. Check filter unit (see section "0").

## 4.3 Cleaning the insert sieve (residual embedding materials)

(See fig. 1, page 5)

1. Screw out knurled nut for insert sieve (10).
2. Pull out and clean insert sieve (8).
3. After re-assembling insert sleeve tighten knurled nut securely by hand.

## 4.4 Letting out blasting agent

(See fig. 1, page 5)

1. Position the unit with sand letting out opening onto the edge of the table.
2. Let out blasting agent by taking off the sand outlet lid (13).

<b>Note</b>	<p>While doing so, it is also advisable to take out and clean the insert sieve (8) (see section "4.3").</p>
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## 4.5 Checking the injector as blasting performance decreases

(See figures 2 and 4, on pages 6 and 14)

As the blasting performance of the unit decreases you should check the injector (20) and/or the blasting nozzle (22) as well as the suction basket (31) as follows:

1. Switch off the unit at the main switch (12) and pull the mains plug!
2. Unhinge the injector holder (19) and take it out of the blasting chamber.
3. Detach spring plug (21) laterally.
4. Pull out blasting nozzle (22) by turning it and by applying counter force to the injector casing (20).
5. Check whether foreign matter is located in the nozzle bore and, if necessary, remove it.
6. Worn-out jets (22) (diameter larger than 4,5 mm) should be removed (see fig. 4 page 14).
7. injector needle (23) should be level with the edge of the injector casing (24). If due to wear and tear the injector needle has shortened by more than 1,5 mm then you should replace the injector.
  - Remove screw (25), seal air hose (27) and take out the injector together with the blasting agent suction hose (26).
8. Check the suction basket (31) in the lower part of the sand basin for dirt particles and, if necessary clean it (for further details see "Letting out blasting agent", section "4.4").

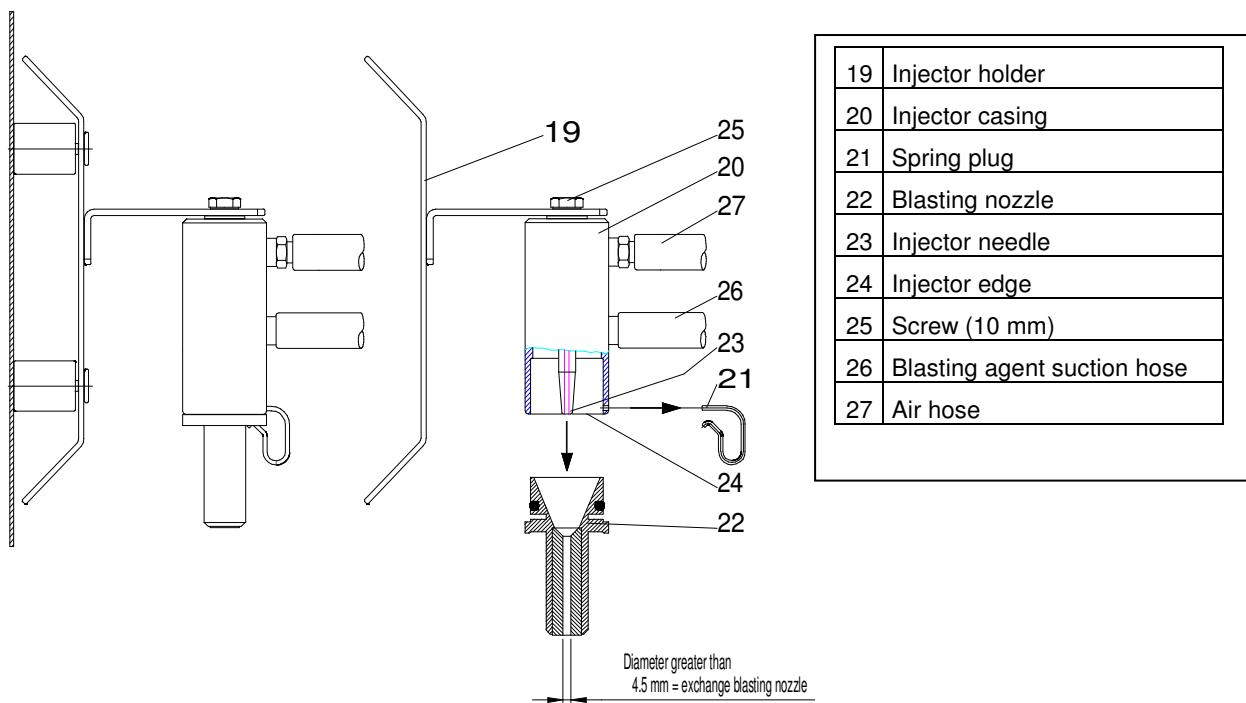


Fig. 4: Disassembling the injector

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## 5 Blasting chamber illumination (24 V)

(See fig. 3, page 7)

The blasting chamber illumination (18) is operated with a safety low voltage of 24 volts.

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<b>Note</b>	When exchanging the tubular lamp press both contacts (holder) slightly apart. Before inserting a new tubular lamp press both contacts (holder) slightly together to fasten the lamp securely.
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## 6 Electrical fuse protection

(See fig. 2 page 6)

- The fuse for feeble currents 2,5 A/T (50) for the transformer is located on the bottom side of the unit (blasting chamber illumination, automatic deactivation device).
- The two main fuses (0.315 A/T) are built into the mains connection socket (15).

## 7 Accessing the electrical/pneumatic control system

(See fig. 2 page 6)

The electrical/pneumatic control system is located on the bottom side of the unit in the front floor compartment (33).

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<b>Danger</b>	Before opening the front floor compartments (33) switch off unit at main switch (12) and pull the mains supply plug. – Removing the 10 screws (34) opens the front floor compartment.
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## 8 Warranty conditions

This device corresponds to current safety regulations and was comprehensively tested before it left the factory.

We confer a 12 month guarantee to you and oblige ourselves during this time to conduct all repairs due to material or manufacturing errors free of cost.

### **Restrictions of the guarantee:**

1. The guarantee expires if repairs are not carried out by us or a specialized commercial workshop.
2. If replacements are made due to the guarantee no prolongation of the initial guarantee period shall follow.
3. Erroneous installation, e.g. non-compliance to the valid VDE regulations or the written instructions.
4. Inappropriate operation or demands made on the device.
5. External effects, e.g. damages incurred during transit, damage from impacts, damages from weathering or other natural phenomena.
6. Repairs and alterations made by an unauthorized third party.
7. Failures of the device due to an adaptation or modification are not regarded under any circumstances as material or production errors. **This guarantee does not cover either the costs of such adaptations or modifications or the replacement of the damage arising from them.**
8. Normal wear such as that of the waterjet nozzles, waterjet tubes including the handpiece and the connector nut, the glass-pane, brushes and illumination, or damage due to erroneous operation do not fall under the guarantee.

In order to be able to offer a comprehensive service to you, we ask that you return the guarantee form (inserted at the start of this instruction manual) by fax or mail (in a windowed envelope).

Fax no.: 0 71 81/ 73 13 9

----- Fold here for window envelope -----

## Copy Guarantee return form

**Maschinenbau  
Harnisch+Rieth GmbH & Co.  
Postfach 1260  
D-73644 Winterbach**

Machine designation:	Manual blasting unit
Machine type:	D-H 22 S
Machine no.:	
Date of purchase:	
Dealer/Store:	
From:	
Date/signature:	

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## 9 EC declaration of conformity

### In the meaning of the EC Machine Directive 2006/42/EG

We herewith declare that due to its design the machine specified below is in conformity with the basic safety and health requirements of the EC directives. In the event of modifications of the machine not approved by us this certificate looses its validity.

Name of the manufacturer : Harnisch+Rieth  
Address of the manufacturer : Küferstraße 14-16, 73650 Winterbach  
Machine designation : Manual blasting unit  
Machine type : D-H 22 S

The following pertinent EC directives were applied:

EC machine directive 2006/42/EG (29.12.2009)  
EC low voltage directive 2006/95 EG (29.12.2007)  
EMC directive 2004/108/EG (20.07.2007)

Following harmonizing standards were applied:

DIN EN ISO 12100	Safety of Machinery—Part 1, General Principles of Design (04.2004)
DIN EN ISO 14121-1	Safety of Machinery – Principles of Risk Assessment (12.2007)
DIN EN 61,010-1	Safety regulations for measuring, control, regulating, and laboratory devices
DIN EN 60204-1	Safety of machinery - Electrical equipment of machines (06.2007)
DIN EN 61000-6-3	Radio-Suppression of Electrical Equipment – Radio Interference Voltage Interference Power (09.2007)
DIN EN 55 014	: Interference suppression of electrical apparatus and installations.
DIN EN 55 104	: Electromagnetic compatibility, noise resistance requirements (category I).

The following national technical specifications were applied:

DIN EN 60335-2-69 : device for removing health-hazardous dusts with returning  
of clean air to working rooms.

A technical documentation is available.

The operation instructions belonging to the machine are also available.

Director of the Quality Control Department

Winterbach, 4. January. 2010